United States Department of the Interior

FISH AND WILDLIFE SERVICE
446 Neal Street
Cookeville, TN 38501

February 5, 2009

Mr. Kevin S. Rose
Environmental Compliance Specialist
Federal Highway Administration
21400 Ridgetop Circle
Sterling, Virginia 20166-6511

Re: FWS #08-F-0607

Dear Mr. Rose:

This document is the biological opinion of the Fish and Wildlife Service (Service) based on our review of the proposed replacement of the Potter Ford Road Bridge over the Obed River and the replacement of the Otter Creek Road Bridge over Daddys Creek in Cumberland County, Tennessee, and its effects on the spotfin chub (*Erimonax monachus*), purple bean (*Villosa perpurpurea*), Cumberland bean pearlymussel (*Villosa trabalis*), Cumberland rosemary (*Conradina verticillata*), and Virginia spiraea (*Spiraea virginiana*) (Tables 1 and 2), per section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). This biological opinion will also address effects to designated critical habitat for the spotfin chub and purple bean. Your August 14, 2008, request for formal consultation was received on August 19, 2008.

This biological opinion is based on information provided in the August 14, 2008, biological assessment and other sources of information. A complete administrative record of this consultation is on file and available for review at the Cookeville Ecological Services Field Office, 446 Neal Street, Cookeville, Tennessee 38501.

Consultation History

April 24, 2008 – Letter from Environmental Consulting and Training Services addressed to Lee Barclay (Service, Cookeville Field Office) requesting information concerning federally listed species that might occur in the project impact areas.

May 30, 2008 – Letter from Lee Barclay to Tara Halstead (Environmental Consulting and Training Services) concurring that the spotfin chub, Cumberland bean pearlymussel, and purple bean are known to occur in the project impact areas, and that surveys should be conducted for the Cumberland rosemary and Virginia spiraea.

August 14, 2008 – Letter from Kevin Rose (Federal Highway Administration) to Lee Barclay transmitting the biological assessment for the projects and requesting initiation of formal consultation.

FWS Log No: 08-F-0607 ***Application No:*** N/A
Date Started: August 19, 2008 ***Ecosystem:*** Lower Tennessee/Cumberland
Applicant: N/A ***Action Agency:*** Federal Highway Administration
Project Title: Replacement of bridges over Daddys Creek and the Obed River
County: Cumberland

Table 1. Species and critical habitat evaluated for effects for the Potter Ford Road Bridge over the Obed River and those where the Service has concurred with a "not likely to adversely affect" determination.

SPECIES OR CRITICAL HABITAT	PRESENT IN ACTION AREA	PRESENT IN ACTION AREA BUT "NOT LIKELY TO BE ADVERSELY AFFECTED"
Spotfin chub	X	
Purple bean	X	
Cumberland bean pearlymussel	X	
Cumberland rosemary	X	X
Virginia spiraea	--------	--------
Critical habitat for spotfin chub	X	
Critical habitat for purple bean	X	

Table 2. Species and critical habitat evaluated for effects for the Otter Creek Road Bridge over Daddys Creek and those for which the Service has concurred with a "not likely to adversely affect" determination

SPECIES OR CRITICAL HABITAT	PRESENT IN ACTION AREA	PRESENT IN ACTION AREA BUT "NOT LIKELY TO BE ADVERSELY AFFECTED"
Spotfin chub	X	
Purple bean	--------	--------
Cumberland bean pearlymussel	X	
Cumberland rosemary	X	X
Virginia spiraea	X	X
Critical habitat for spotfin chub	X	
Critical habitat for purple bean	--------	--------

Based on results of onsite surveys which did not reveal populations within the project impact areas, we concur that the proposed Otter Creek Road Bridge over Daddys Creek and the Potter Ford Road Bridge over the Obed River are not likely to adversely affect the Cumberland rosemary and Virginia spiraea. In view of this, the requirements of section 7 of the Endangered Species Act have been fulfilled for those species and this biological opinion will not address them further.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The proposed projects involve replacement of an existing bridge on Otter Creek Road over Daddys Creek and construction of a new bridge on Potter Ford Road over the Obed River in Cumberland County, Tennessee. The new Otter Creek Road Bridge will be constructed approximately 100 feet upstream from the existing bridge. The new bridge will be approximately 150 feet in length and 17 feet in width. Two piers will be constructed in the stream and riprap will be placed at each end to stabilize the streambanks. The existing bridge will be left in place during construction, but it will be removed upon completion of the new bridge.

The original bridge at Potter Ford Road washed out in 2001. The new bridge will be constructed at the same location. The new bridge will be approximately 120 feet in length and 17 feet in width. Two instream piers will be constructed and riprap will be placed at each end to stabilize the streambanks. Prior to construction of the new bridge, the concrete abutments and approaches and the piers of the washed out structure will be removed.

To avoid or minimize impacts to the species and their habitats in the Obed River and Daddys Creek, the following protective measures will be employed:

1. Temporary establishment of turf to stabilize disturbed areas and control erosion.
2. Installation of plastic liners to control erosion.
3. Installation of wire-backed silt fencing to control erosion.
4. Installation of silt fence check dams for erosion control.
5. Construction of check dams with erosion control mats and riprap for erosion control.
6. Use of sandbags for erosion control.
7. Replacement of topsoil and establishment of turf after completion of construction.

8. Planting and maintaining native vegetation on streambanks to stabilize disturbed areas.

9. Accomplishing construction at river and creek crossings during low flow periods.

10. Stabilizing streambanks by reseeding with native vegetation beneficial to local wildlife as quickly as possible.

11. Instream and streambank revegetation will comply with Fish and Wildlife Service, Tennessee Department of Environment and Conservation, and Tennessee Wildlife Resources Agency recommendations.

12. Properly maintaining construction equipment to control emissions.

13. No onsite burning of waste.

14. Handling and storing hazardous materials in accordance with package labels, manufacturer's instructions, and material safety data sheets.

15. Handling and storing solid and hazardous wastes generated onsite in accordance with Environmental Protection Agency and Tennessee Department of Environment and Conservation regulations.

16. Handling and storing materials, equipment, and wastes to prevent spills and releases into surface waters and the environment.

We have described the action areas to include stream reaches 200 feet upstream (includes a 100-foot buffer zone upstream) to 2,000 feet downstream from the existing bridge on Daddys Creek (Otter Creek Road) (Figure 1); and 100 feet upstream (includes a 50-foot buffer zone upstream) to 2,000 feet downstream from the existing (washed out) bridge on the Obed River (Potters Ford Road) (Figure 2) for reasons that will be explained and discussed in the **"EFFECTS OF THE ACTION"** section of this consultation.

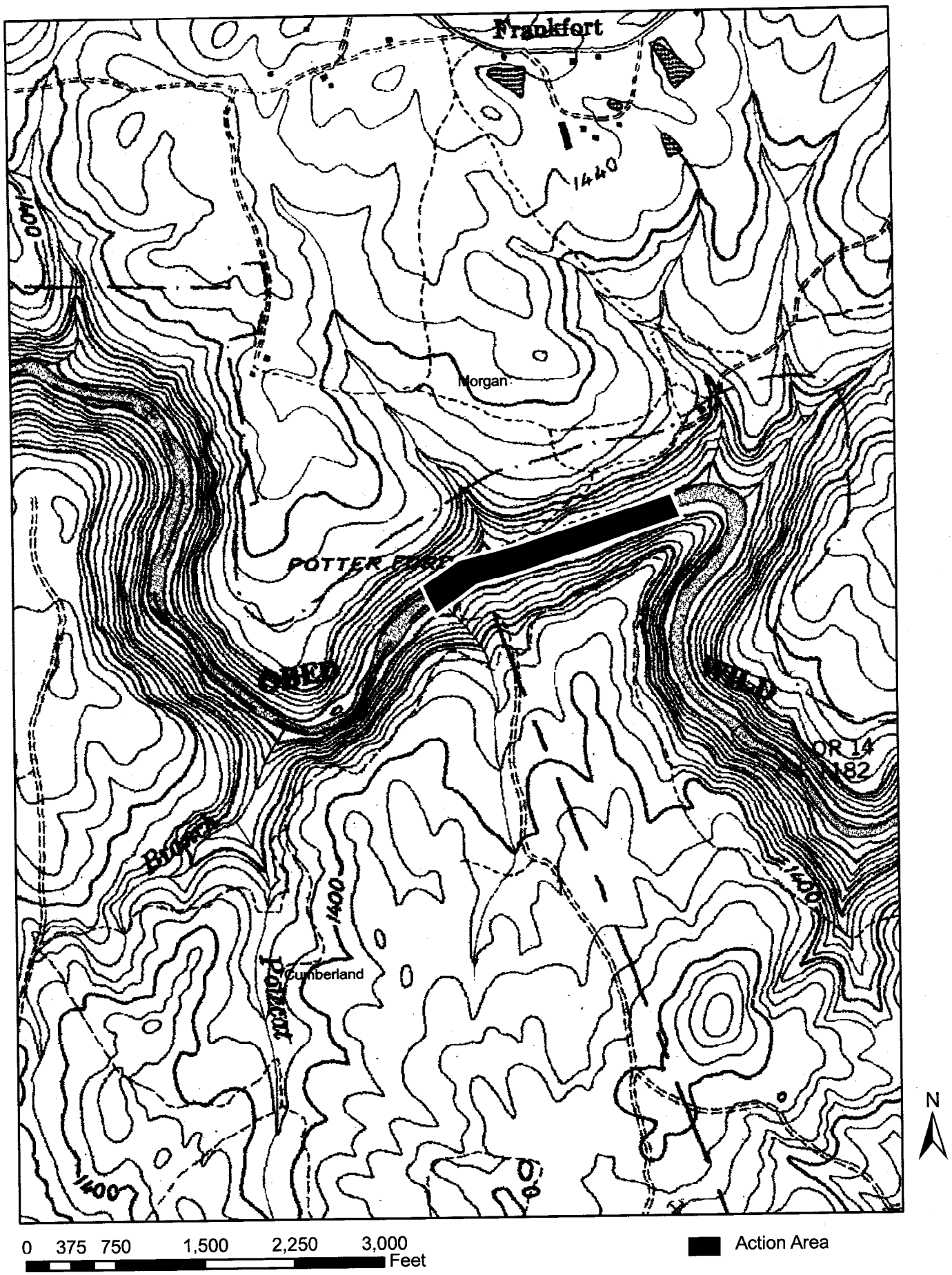
STATUS OF THE SPECIES/CRITICAL HABITAT

Species/critical habitat description

Spotfin chub

The spotfin chub (*Erimonax monachus*) was listed as a threatened species on October 11, 1977 (Federal Register 1977). At the time of listing, the following stream reaches were designated as critical habitat for the species:

Figure 2. Potter Ford Action Area (Obed River)



1. **Little Tennessee River**, in Macon and Swain counties, North Carolina, from the headwaters of Fontana Lake upstream to the North Carolina/Georgia line.

2. **North Fork Holston River**, from the Virginia/Tennessee state line through Scott and Washington counties, Virginia.

3. **North Fork Holston River**, from the confluence of the South Fork Holston River upstream to the state line in Hawkins and Sullivan counties, Tennessee.

4. **Clear Creek**, from its confluence with the Obed River upstream to Interstate 40 in Morgan, Fentress, and Cumberland counties, Tennessee.

5. **Obed River**, from its confluence with the Emory River upstream to Interstate 40 in Morgan and Cumberland counties, Tennessee.

6. **Daddys Creek**, from its confluence with the Obed River upstream to U.S. 127 in Morgan and Cumberland counties, Tennessee.

7. **Emory River**, the entire reach of the river in Morgan County, Tennessee.

The spotfin chub is a member of the minnow family (Cyprinidae). Adults grow to a maximum length of approximately four inches (USFWS 1983; Etnier and Starnes 1993). The body is elongated and somewhat compressed, dusky green above the lateral line and bright silver on the sides with a dark spot at the base of the caudal (tail) fin (USFWS 1983; Etnier and Starnes 1993). The dorsal portion of the body of breeding males is shiny blue-green, and the top of the head is covered with tubercles.

A recovery plan was approved for the spotfin chub on November 21, 1983. Criteria for recovery of the species include:

1. Through protection of existing populations and/or by introductions and/or discoveries of new populations there exist viable populations* in the Buffalo River system, Upper Little Tennessee River, Emory River system, and Lower North Fork Holston River.

    a. The species persists in the Buffalo River in the area of Grinders Creek and/or some other river section.

    b. The species occupies its preferred habitat in the Upper Little Tennessee River throughout an approximately 32.5-kilometer reach from the head of Fontana Reservoir to Franklin Dam. This will be measured by determining that the species exists at a minimum of 10 locations within the designated reach.

c. The species occupies its preferred habitat in the Emory River system from its confluence with the Obed River to Watts Bar Reservoir, in Clear Creek from its confluence with White Creek downstream to its confluence with the Obed River, and Daddys Creek from Creek Mile 5.6 downstream to its confluence with the Obed River. This will be measured by determining that the species exists at a minimum of eight locations in the Emory River section, five locations in the Clear Creek section, and five locations in the Daddys Creek section.

d. The species occupies its preferred habitat in the North Fork Holston River throughout the river reach from its mouth upstream for 72 kilometers. This will be measured by determining that the species exists at a minimum of 15 locations within that river reach.

2. Through introductions and/or discovery of two new populations there exist viable populations in two other rivers.

(*viable population – monitoring for a 10-year period [biannual samples] indicates that the species is reproducing (at least two year classes present each year sampled) and that the population is either stable or expanding)

Cumberland bean pearlymussel

The Cumberland bean pearlymussel (*Villosa trabalis*) was listed as an endangered species on June 14, 1976 (Federal Register 1976). Critical habitat was not designated for the species.

The Cumberland bean pearlymussel is a medium-sized species. The shell is oval and elongate in shape. The anterior end is rounded and the ventral margin is slightly rounded ending in a rounded point posteriorly (Parmalee and Bogan 1998; USFWS 1984). The shell of the adult male is slightly narrowed at the center and is truncated above the posterior ridge; shells of the female are more evenly oval and are less truncated posteriorly (Parmalee and Bogan 1998). The outer surface is dark olive green with numerous wavy green rays. The inner surface is bluish-white or white with iridescent blue on the posterior end (USFWS 1984; Parmalee and Bogan 1998).

A recovery plan was approved for the Cumberland bean pearlymussel on August 22, 1984 (USFWS 1984). Criteria for delisting of the species are:

1. A viable population of *Villosa trabalis* exists in Buck Creek, Rockcastle River, and the Little South Fork Cumberland River. These three populations are dispersed throughout each river so that it is unlikely that one event would cause the total loss of either population.

2. Through reestablishment and/or discoveries of new populations, viable populations exist in two additional rivers (to include at least one in the Tennessee River system). Each of these rivers will contain a viable population that is distributed such that a single event would be unlikely to eliminate *Villosa trabalis* from the river system.

3. The species and its habitat are protected from present and foreseeable human related and natural threats that may interfere with the survival of any of the populations.

4. Noticeable improvements in coal-related problems and substrate quality have occurred in the upper Cumberland and Tennessee drainages and no foreseeable increase in coal-related siltation exists in streams containing *V. trabalis*.

Purple bean

The purple bean was listed as an endangered species on January 10, 1997 (Federal Register 1997). At the time of listing, critical habitat was not designated for the species. Critical habitat was designated on August 31, 2004 (Federal Register 2004) to include the following:

1. **Obed River**, from the confluence with the Emory River in Morgan County, Tennessee, upstream for 25 miles to Adams Bridge in Cumberland County, Tennessee.

2. **Powell River**, from the U.S. 25E bridge in Claiborne County, Tennessee, upstream for 94 river miles in Lee County, Virginia.

3. **Clinch River**, from Grissom Island (CRM 159) in Hancock County, Tennessee, upstream for 148 river miles to the confluence with Indian Creek in Tazewell County, Virginia.

   Indian Creek, from its confluence with the Clinch River upstream for 2.5 stream miles in Tazewell County, Virginia.

   Copper Creek, from its confluence with the Clinch upstream for 13 stream miles River in Scott County, Virginia.

4. **Beech Creek**, from stream mile 2.0 to stream mile 16.0 in Hawkins County, Tennessee.

The purple bean is a medium-sized mussel, growing to a maximum length of approximately two inches (USFWS 2004; Parmalee and Bogan 1998). Shells are slightly inflated, elongated, and oval in shape. The anterior end of the shell is rounded and the ventral margin is straight or slightly rounded, ending in a rounded point at the posterior end (USFWS 2004; Parmalee and

Bogan 1998). The outside surface of the shell is olive green with faint wavy green rays. The inner surface of the shell is light to dark purple and may be iridescent posteriorly (USFWS 2004; Parmalee and Bogan 1998).

A recovery plan was approved for the purple bean on May 4, 2004. The species will be considered for reclassification to threatened status when the following criteria are met:

1. Through protection of extant stream populations (e.g., continuing to use existing regulatory mechanisms, establishing partnerships with various stakeholders, using BMP's, minimizing or eliminating threats), discovery of currently unknown stream populations, and/or reestablishment of historical stream populations, there exists:

    a. At least four distinct viable stream populations of the purple bean in the upper Tennessee River system. This will be accomplished by:

        (1) Protection of all extant stream populations (i.e., upper Clinch River/Indian Creek, lower Clinch River/Copper Creek, Obed River, Beech Creek) and ensuring that they all have viable population status.

        2. One distinct naturally reproduced year class exists within each of the viable populations. The year class must have been produced within 5 years prior to the time that the species is reclassified from endangered to threatened. Within 1 year before the downlisting date, gravid females of the mussels and their host fish must be present in each viable population.

        3. Research studies of the mussels' biological and ecological requirements have been completed and any required recovery measures developed and implemented from these studies are beginning to be successful (see Recovery Tasks 1.4.1, 1.4.2, 1.4.5, and 1.4.6), as evidenced by an increase in population density of approximately 20 percent and/or an increase in the length of the river reach of approximately 10 percent inhabited by the species as determined through biennial monitoring (see Recovery Task 5).

        4. No foreseeable threats exist that would likely impact the survival of this species over a significant portion of its range (see Recovery Tasks 1.4.3 and 1.4.4).

        5. Within larger streams (e.g., Rockcastle River, Big South Fork, Clinch River, Powell River, upper Holston River/North Fork Holston River, Elk River, Duck River, Buffalo River), the species is distributed over a long enough reach that a single catastrophic

event is not likely to eliminate or significantly reduce the entire population in that stream to a status of nonviable (see Recovery Task 4.1).

6. Biennial monitoring of the species yields the results outlined in "criterion 1.a.e" over a 10-year period (see Recovery Task 5).

The purple bean will be considered for delisting when the following criteria are met:

1. Through the protection of extant stream populations (e.g., continuing to use existing regulatory mechanisms, establishing partnerships with various stakeholders, using BMP's, minimizing or eliminating threats), discovery of currently unknown stream populations, and/or reestablishment of historical stream populations, there exists:

   a. At least five distinct viable stream populations of the purple bean in the upper Tennessee River system. This will be accomplished by:

      (1) Protecting all extant stream populations (i.e., upper Clinch River/Indian Creek, lower Clinch River/Copper Creek, Obed River, and Beech Creek) and ensuring that they all have viable population status.

      (2) Reestablishing a viable stream population in the upper Tennessee River system (e.g., Powell River).

2. Two distinct naturally reproduced year classes exist within each of the viable populations. Both year classes must have been produced within 10 years, and one year class must have been produced within 5 years of the recovery date. Within 1 year before the recovery date, gravid females of the mussels and their host fish must be present in each viable population.

3. Research studies pertaining to the mussels' biological and ecological requirements have been completed and recovery measures developed and implemented from these studies have been successful (see Recovery Tasks 1.4.1, 1.4.2, 1.4.5, and 1.4.6), as evidenced by an increase in populations density of approximately 20 percent and/or an increase in the length of the river reach of approximately 10 percent inhabited in each of the viable populations as determined through biennial monitoring (see Recovery Task 5).

4. No foreseeable threats exist that would likely threaten the survival of any of the viable populations (see Recovery Tasks 1.4.3 and 1.4.4).

5. Within larger streams (e.g., Rockcastle River, Big South Fork, Clinch River, Powell River, upper Holston River/North Fork Holston River, Elk River, Duck

River, Buffalo River), the species is distributed over a long enough reach that a single catastrophic event is not likely to eliminate or significantly reduce the entire population in that stream to a status of nonviable (see Recovery Task 4.1).

6. Biennial monitoring of the species yields the results outlined in "criterion 1.a.e" above over a 10-year period (see Recovery Task 5).

In addition to the criteria listed above, specific recovery criteria are contained in the recovery plan to address each of the five factors considered in the listing process. The specific recovery tasks are designed to provide a measure of progress in removing threats to a sufficient degree to enable Service biologists to consider reclassification or downlisting (USFWS 2004).

Life History

Spotfin chub

Adult spotfin chubs inhabit clear, upland streams in areas with swift current over boulder substrate (Etnier and Starnes 1993). Juveniles are typically found in moderate currents over gravel substrate. The species is insectivorous, feeding predominantly on larvae and pupae of midges and blackflies; a variety of caddisfly species are also consumed (USFWS 1983; Etnier and Starnes 1993).

The spawning season of the spotfin chub begins in mid-May and extends through mid-August (USFWS 1983; Etnier and Starnes 1993). Males and females are generally mature and able to spawn at age two. The life span of the species is slightly over three years. Females deposit eggs in boulder crevices and may spawn repeatedly during the breeding season (Etnier and Starnes 1993).

Cumberland bean pearlymussel

Habitat for the Cumberland bean pearlymussel consists of large streams and small rivers. It is typically found in riffle and shoal areas with swift flow over stable substrate of sand, gravel, and cobble (USFWS 1984; Parmalee and Bogan 1998). Individuals are sedentary; they likely remain in place unless their habitats are dewatered or they are dislodged from the substrate. It is a filter feeder, siphoning algae, plankton, and detritus from the water column.

The Cumberland bean pearlymussel is a long-term breeder. Fertilization of eggs and larval development occur from mid-summer through early winter. Females hold the larval mussels over winter and release them the following spring. Host fish have been identified and include the barcheek darter, fantail darter, rainbow darter, snubnose darter, sooty darter, striped darter, and stripetail darter (Parmalee and Bogan 1998).

Although the Cumberland bean pearlymussel was not widely distributed in the Tennessee River system (USFWS 1984), it was reported to be a common species in the Cumberland River system

(Neel and Allen 1964). Impoundment of rivers in those drainages, pollution, and sedimentation likely are the predominant contributors to the decline of the species and its eventual listing as an endangered species (USFWS 1984).

Purple bean

Habitat of the purple bean is riffle habitat in small streams to medium-sized rivers. Individuals are generally found in areas with moderate current velocity over clean-swept sand/gravel/cobble substrate. The species is rarely found in deep pools or slackwater areas, but sometimes occurs out of the main stream current adjacent to beds of water willow or under flat slab rocks (USFWS 2004; Parmalee and Bogan 1998). Similarly to other mussel species, the purple bean is likely sedentary, remaining burrowed into the substrate and moving only if its habitat is dewatered or if it is dislodged. Individuals feed by filtering algae, plankton, and detritus from the water column.

The purple bean is a long-term breeder. Gravid females have been observed in January and February (USFWS 2004), indicating that the species is a long-term breeder. Host fish have been identified and include the fantail darter, greenside darter, black sculpin, and mottled sculpin (USFWS 2004; Parmalee and Bogan 1998).

Factors that contributed to the decline and ultimate listing of the purple bean as an endangered species include impoundment, pollution, and sedimentation (USFWS 2004). Construction of impoundments has likely had less of an impact on populations of the purple bean since the species typically inhabits smaller rivers and streams in the upper reaches of the drainages (USFWS 2004). Pollution and sedimentation from activities such as coal mining, gravel dredging, pesticide application, and spills of toxic materials have had significant adverse impacts on the streams and fauna (USFWS 2004).

Population Dynamics

Spotfin chub

The size of a population and its natural variance are important factors that affect a species' response to disturbance in its environment. However, information about the minimum population size that would enable the spotfin chub to respond to and recover from disturbance is unknown. Populations exist in the North Fork Holston River, South Fork Holston River, Little Tennessee River, Buffalo River, Obed River, and Daddys Creek. The species has been introduced into the Tellico River, Abrams Creek, and Shoal Creek. All extant and introduced populations, except for the Obed River/Daddys Creek populations, are separated from each other by impoundments and long sections of river. Genetic interchange among extant populations is therefore likely not occurring.

Cumberland bean pearlymussel

Information about the minimum population size needed to enable this species to respond to and recover from disturbance is not known. The species persists in streams that support moderately diverse mussel communities. Populations are isolated from each other and genetic interchange is not occurring.

Purple bean

The minimum population size needed to enable this species to respond to and recover from disturbance is not known. The species is restricted in range and extant populations are isolated from each other. Numbers within each population have likely declined and the number of populations is likely declining.

Status and Distribution

Spotfin chub

Historic records indicate that the spotfin chub was widely distributed in the Tennessee River drainage. The species was recorded from the Buffalo River (Lewis County, TN), Grinders Creek (Lewis County), Little Bear Creek and Shoal Creek (Lauderdale County, AL), South Chickamauga Creek (Catoosa County, GA), Citico Creek and Abrams Creek (Monroe County, TN), Little Tennessee River, Tuckasegee River, and Noland Creek (Graham County, NC), Spring Creek and Swannanoa River (Buncombe County, NC), Whites Creek (Rhea/Roane counties, TN), White Creek, Daddys Creek, Obed River, and Emory River (Cumberland and Morgan counties, TN), Clinch River, Ball Creek, and Big Sycamore Creek (Anderson County, TN), Indian Creek (Claiborne County, TN), North Fork Holston River (Hawkins and Sullivan counties, TN; Washington and Smyth counties, VA), and the South Fork Holston River (Sullivan County, TN; and Washington County, VA) (USFWS 1983).

Extant populations of spotfin chub exist in the Buffalo River and Little Buffalo River (Lewis County, TN); Emory River, Obed River, Daddys Creek (Morgan and Cumberland counties, TN); Holston River (Hawkins County, TN); Little Tennessee River (Graham and Cherokee counties, NC); and North Fork Holston River (Hawkins County, TN; Washington County, VA) (USFWS 1983; Etnier and Starnes 1993). The species has also been reintroduced within its historic range in Abrams Creek (Blount County, TN), the Tellico River (Monroe County, TN), and Shoal Creek (Lawrence County, TN). None of the reintroduced populations have, however, shown evidence of reproduction or recruitment to date.

Cumberland bean pearlymussel

Historic records indicate that the Cumberland bean pearlymussel occurred in the upper Cumberland River system in Kentucky, the Tennessee River system upriver from Muscle Shoals, Alabama, and in the upper Tennessee River system in Tennessee and Virginia (USFWS 1984; Parmalee and Bogan 1998). Records exist from the Tennessee River (TN), South Chickamauga Creek (TN), Paint Rock River (AL), Flint River (AL), Hiwassee River (TN), Clinch River (TN, VA), Cumberland River (TN, KY), Buck Creek (KY), Obey River (TN), Rockcastle River (KY), Laurel Fork Rockcastle River (KY), Beaver Creek (KY), Big South Fork (TN, KY), Middle Fork Rockcastle River (KY), Horselick Creek (KY), Roundstone Creek (KY), Little South Fork (KY), Kennedy Creek (KY), Little Tennessee River (TN), Little Chucky Creek (TN), Lick Creek (TN), Caney Fork River (TN), Obed River (TN), and Bear Creek (KY) (USFWS 1984; Parmalee and Bogan 1998).

The Cumberland bean pearlymussel is presently known to occur in the Hiwassee River (TN), Beech Creek (TN), Obed River (TN), Little South Fork (KY), Buck Creek (KY), and the Big South Fork (TN) (USFWS 1984; Parmalee and Bogan 1998). This represents a 75 percent reduction in the species' range.

Purple bean

The purple bean historically occurred in the Clinch River (VA, TN), Indian Creek (VA), Copper Creek (VA), Powell River (VA), Emory River (TN), Obed River (TN), Daddys Creek (TN), North Fork Holston River (VA, TN), Beech Creek (TN), North Fork Beech Creek (TN) (USFWS 2004; Parmalee and Bogan 1998).

Extant populations of the purple bean are reported from Beech Creek (TN), Obed River (TN), Clinch River (VA), Indian Creek (VA), and Copper Creek (VA) (USFWS 2004; Parmalee and Bogan 1998).

Analysis of the Species/Critical Habitat Likely to be Affected

The Federal Highway Administration considered the potential effects of the projects to five federally listed species and to designated critical habitat for two species. The projects are located within the ranges of two federally listed plant species, Cumberland rosemary and Virginia spiraea. Surveys of the project impact areas revealed that neither plant species occurs within the action areas of the projects; Cumberland rosemary was found approximately 500 feet upstream and Virginia spiraea is known to occur approximately 2,500 feet upstream from the Otter Creek Road Bridge over Daddys Creek, outside the action area.

Records for the Cumberland bean pearlymussel and spotfin chub exist in Daddys Creek upstream and downstream from the proposed project. The spotfin chub, Cumberland bean pearlymussel, and purple bean are known to exist upstream and downstream from the proposed project on the

Obed River. Also, the Otter Creek Road project is within designated critical habitat for the spotfin chub and the Potter Ford project is within critical habitat for the spotfin chub and the purple bean.

ENVIRONMENTAL BASELINE

The Obed River originates in Cumberland County. It flows approximately 45 miles in a northeasterly direction where it joins the Emory River at River Mile 28.6 in Morgan County. Daddys Creek is a major tributary to the Obed River. It originates in Bledsoe County and flows approximately 48 miles northeast before joining the Obed River at River Mile 9.1 in Morgan County. Both streams are located on the Cumberland Plateau. Habitat in the watersheds of the Obed River and Daddys Creek consists largely of forest with scattered pastureland. A portion of the Obed River flows adjacent to the City of Crossville and a portion of Daddys Creek flows adjacent to the Town of Crab Orchard. Those municipalities have been developed for residential and commercial uses. Consequently, the Obed River and Daddys Creek have been impacted by bridge and road construction, utility line crossings, and municipal discharges.

The project areas are located on reaches of the streams within the Catoosa Wildlife Management Area. This 88,000-acre area is owned and managed by the Tennessee Wildlife Resources Agency for game and nongame wildlife. The area is used for hunting, fishing, canoeing, and other recreational activities.

Status of the Species within the Action Area

The Cumberland bean pearlymussel and spotfin chub exist in Daddys Creek upstream and downstream from the proposed project. The spotfin chub, Cumberland bean pearlymussel, and purple bean are known to exist upstream and downstream from the proposed project on the Obed River. Also, Daddys Creek in the area of the Otter Creek Road bridge project is within designated critical habitat for the spotfin chub and the Obed River in the Potter Ford bridge project area is within critical habitat for the spotfin chub and the purple bean. Quantitative estimates for the species in these stream reaches are not available. The mussels likely occur in low numbers in areas of suitable habitat. Spotfin chubs likely move through and within the project areas.

Factors Affecting Species Environment within the Action Area

Daddys Creek and the Obed River in the project areas are within the Catoosa Wildlife Management Area. The area along both streams is primarily forested and neither stream is used by motorized watercraft. Impacts from recreational use are likely of relatively short duration and low magnitude. The project area on the Obed River is approximately 13 miles downstream from Crossville; the Daddys Creek project area is approximately 14 miles downstream from Crab

Orchard. Impacts to the streams and fauna in the project areas from activities in those municipalities are likely minimal.

EFFECTS OF THE ACTION

Factors to be Considered

The proposed projects will occur at locations known to contain the spotfin chub, Cumberland bean pearlymussel, and purple bean. Construction will likely take several weeks at each location, but could vary depending upon weather and river conditions. Two instream piers will be constructed for each bridge and riprap will be placed to stabilize each streambank at the bridge abutments.

The bridge at Daddys Creek will be constructed approximately 100 feet upstream from the existing bridge. If vegetation clearing is needed upstream from the site, equipment will be needed upstream. Also, equipment may be staged upstream. Effects may occur up to 100 feet upstream from the existing bridge. Effects from construction may extend 2,000 feet downstream from the site because the stream at and below the site consists of swift-flowing riffle habitat.

The bridge on the Obed River will be constructed at the location where the previous bridge crossed the river. Effects from operation of equipment and other construction-related activities may occur up to 100 feet upstream.

Analyses for Effects of the Action

Direct effects to the species and habitat from the proposed projects could result from sediment entering the streams from areas disturbed during construction. Fish would likely move out of the area. Mussels would likely burrow deeper into the substrate to avoid prolonged periods of sedimentation. Sediment would provide an unstable substrate for mussels; they could be dislodged during subsequent high flow events. Direct effects could also result during construction of instream piers. Mussels could be directly affected if individuals inhabit the footprint of the pier. Also, if concrete spills into the stream during construction of the piers, significant mortality to fish and mussels could occur. And, if equipment is staged too close to the stream, pollutants such as grease, oil, petroleum, and detergents could enter the stream during storm events and result in direct mortality to fish and mussels. Pollutants could also cause indirect chronic effects to aquatic organisms. Configuration and orientation of the bridge piers could change stream flows, resulting in scouring of the stream bottom and deposition of material in areas not presently subject to scour or deposition.

The spotfin chub and the mussels may also be indirectly affected by the proposed projects. Replacement of the Otter Creek Road Bridge over Daddys Creek and construction of a new Potter Ford Road Bridge over the Obed River may accommodate higher volumes of traffic which

could have adverse effects on the streams as a result of increased runoff. Replacement of the bridges may also result in increased use by canoers, kayakers, anglers, and other recreationists, which could adversely affect the aquatic habitats.

Species' Response to a Proposed Action

Fish will move out of the project area during periods when the stream habitat is being disturbed and move back into the area when the disturbance ends. Mussels are sedentary and remain in the area. If their habitat is disturbed, they will burrow into the substrate and remain there until the disturbance ends. If the disturbance lasts for extended periods of time, individuals will become stressed and eventually perish if they cannot resume normal respiratory and feeding activities.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation under section 7 of the Act.

The proposed bridge projects are located within the Catoosa Wildlife Management Area, which is owned and managed by the Tennessee Wildlife Resources Agency. Activities such as prescribed burning or logging may occur in the area as part of management actions. Such activities could possibly affect the stream habitats and the species.

CONCLUSION

(NOTE: This biological opinion does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 C.F.R. 402.02. Instead, we have relied upon the statutory provisions of the ESA to complete the following analysis with respect to critical habitat.)

After reviewing the current status of the spotfin chub, Cumberland bean pearlymussel, and purple bean, the environmental baseline for the action area, the effects of the proposed bridge replacement and construction projects, and the cumulative effects, it is our biological opinion that the replacement of the Otter Creek Road bridge over Daddys Creek and construction of a new bridge on Potter Ford Road over the Obed River, as proposed with protective measures described in the biological assessment, are not likely to jeopardize the continued existence of the spotfin chub, purple bean, or Cumberland bean pearlymussel. With protective measures in place, the effects of the projects are likely to be of low intensity and magnitude. Also, construction

should be completed in a relatively short period. The projects also are not likely to destroy or adversely modify critical habitat designated for the spotfin chub or the purple bean.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation under section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the Federal Highway Administration so that they become binding conditions of any grant or contract issued to the Tennessee Department of Transportation, as appropriate, for the exemption in section 7(o)(2) to apply. The Federal Highway Administration has a continuing duty to regulate the activity covered by this incidental take statement. If the Federal Highway Administration: (1) fails to assume and implement the terms and conditions, or (2) fails to require the Tennessee Department of Transportation to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to any contract or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Federal Highway Administration must report the progress of the action, and its impact on the species to the Service as specified in the incidental take statement. [50 CFR Section 402.14(I)(3)]

AMOUNT OR EXTENT OF TAKE ANTICIPATED

We expect incidental take of the spotfin chub, purple bean, and Cumberland bean pearlymussel will be difficult to detect for the following reasons: (1) the spotfin chub, Cumberland bean pearlymussel, and purple bean are small. Individuals reach maximum lengths of less than four inches; (2) the two mussel species spend the majority of their lives burrowed into the stream bottom. Unless they are dislodged or their habitats are dewatered, they may remain in place for life; (3) the spotfin chub is mobile. It lives in the water column and moves constantly; (4)

finding a dead or impaired individual of any of the three species and attributing death or injury to project-related activities would be difficult and would require extensive searching.

However, the following level of take of this species can be expected by loss of habitat or changes in water quality because the spotfin chub, Cumberland bean pearlymussel, and purple bean rely on good water quality and clean, stable sand and gravel substrate.

The proposed projects could result in take of up to 2200 feet of habitat in Daddys Creek and up to 2100 feet of habitat in the Obed River. All individuals of the spotfin chub, Cumberland bean pearlymussel, and purple bean within those areas could be taken by construction of the proposed projects.

EFFECT OF THE TAKE

In the accompanying biological opinion, we determined that this level of expected take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

REASONABLE AND PRUDENT MEASURES

We believe the following reasonable and prudent measures are necessary and minimize impacts of incidental take of the spotfin chub, Cumberland bean pearlymussel, and purple bean:

1. Instream work will be done to avoid direct effects to the listed species.

2. If pouring of concrete at the project sites is necessary, it will be conducted in a way that avoids or minimizes the potential for spillage.

3. Construction of bridge piers will be done in a way that minimizes impacts to the stream habitat.

4. Removal of the existing bridge over Daddys Creek will be done in a manner that will minimize the potential for adverse impacts to the stream.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, the Federal Highway Administration must comply with the following terms and conditions, which carry out the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

1. Instream work will be done from October 1 through May 1 to avoid the spawning season of the spotfin chub, purple bean, and Cumberland bean pearlymussel.

2. If pouring of concrete is necessary to construct the bridge piers, thorough inspection of the forms will be conducted before pouring begins to ensure that concrete will not leak into the stream. A person with authority to halt construction will be onsite during pouring. If leakage or spillage of concrete into the stream is observed, pouring will cease immediately and will not resume until appropriate corrective measures are implemented to prevent further spillage or leakage. This office will be notified as soon as possible concerning the spill/leak and corrective measures that were implemented.

3. Bridge piers will be constructed in a shape and orientation that will not impede stream flows and will not accumulate debris.

4. Equipment will not be operated in the stream channel during construction or to accomplish removal of the existing bridge. Pieces of the bridge will not be dropped into the stream and dragged to the streambank. If a piece of the bridge inadvertently falls into the stream, it will be lifted out by crane. Bridge piers will be removed only as close to the surface of the stream bottom as possible.

Upon locating a dead, injured, or sick individual of an endangered or threatened species, initial notification must be made to the Fish and Wildlife Service Law Enforcement Office at 220 Great Circle Road, Nashville, Tennessee 37228; telephone 615/736-5532. Additional notification must be made to the Fish and Wildlife Service Ecological Services Field Office at 446 Neal Street, Cookeville, Tennessee; telephone 931/528-6481. Care should be taken in handling sick or injured individuals and in the preservation of specimens in the best possible state for later analysis of cause of death or injury.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. We believe that no more than 2200 feet of spotfin chub and Cumberland bean pearlymussel habitat in Daddys Creek and 2100 feet of spotfin chub, Cumberland bean pearlymussel, and purple bean habitat in the Obed River; and all individuals of those species occupying those stream reaches; will be incidentally taken. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The Federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help carry out recovery plans, or to develop information.

We recommend the following measure:

> The Federal Highway Administration should provide funding to appropriate academic or scientific institutions for biological and ecological studies of the listed species addressed in this biological opinion. Studies should include habitat and ecological requirements, population viability analyses, and aspects of life history. Such information is generally lacking for the listed species addressed in this biological opinion. Studies that provide such information would be invaluable to resource managers and biologists in making sound decisions for the management and protection of those species.

In order for us to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, we request notification of the conservation recommendations carried out.

REINITIATION NOTICE

This concludes formal consultation on the actions outlined in the consultation request. As written in 50 CFR Section 402.16, reinitiation of formal consultation is required where discretionary Federal Highway Administration involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take provided in the Incidental Take section is exceeded; (2) new information reveals effects of the Federal Highway Administration action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the Federal Highway Administration action is later modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease until reinitiation.

For this biological opinion, the incidental take would be exceeded when the take exceeds 2200 feet of stream habitat in Daddys Creek or 2100 feet of habitat in the Obed River, which is what has been exempted from the prohibitions of section 9 by this opinion. We appreciate the cooperation of the Federal Highway Administration during this consultation. We would like to continue working with you and your staff regarding these projects. For further coordination please contact Jim Widlak of my staff at 931/528-6481, ext. 202.

Lee A. Barclay, Field Supervisor — Date 2/5/09

LITERATURE CITED

Etnier, D.A. and W.C. Starnes. 1993. The Fishes of Tennessee. University of Tennessee Press, Knoxville, Tennessee. 681 p.

Federal Register. 1976. Endangered status for 159 taxa of animals. 41(115):24062-24067.

Federal Register. 1997. Determination of endangered status for the Cumberland elktoe, oyster mussel, Cumberlandian combshell, purple bean, and rough rabbitsfoot. 62(7):1647-1658.

Federal Register. 1977. Final threatened status and critical habitat for five species of southeastern fishes. 42(175):45526-45530.

Neel, J.K. and W.R. Allen. 1964. The mussel fauna of the upper Cumberland Basin before its impoundment. Malacologia 1:427-459.

Parmalee, P.W. and A.E. Bogan. 1998. The Freshwater Mussels of Tennessee. University of Tennessee Press, Knoxville. 328 p.

U.S. Fish and Wildlife Service. 2004. Recovery plan for Cumberland elktoe, oyster mussel, Cumberlandian combshell, purple bean, and rough rabbitsfoot. U.S. Fish and Wildlife Service, Atlanta, Georgia. 168 p.

U.S. Fish and Wildlife Service. 1983. Spotfin chub recovery plan. U.S. Fish and Wildlife Service, Atlanta, Georgia. 46 p.

U.S. Fish and Wildlife Service. 1984. Cumberland bean pearly mussel recovery plan. U.S. Fish and Wildlife Service, Atlanta, Georgia. 58 p.

Appendix 1

Table 3. Biological opinions within the species' ranges that have been issued for adverse impact.

OPINIONS (YR/NUMBER)	SPECIES	NUMBERS	HABITAT	
			Critical Habitat	Habitat
1992	Spotfin chub, Virginia spiraea, Cumberland bean pearlymussel	0	20 miles of spotfin chub CH impacted within action area; no take anticipated for Cumberland bean	
1989	Cumberland bean pearlymussel	No take anticipated		
1991	Cumberland bean pearlymussel	No take anticipated		
2000	Cumberland bean pearlymussel	No take anticipated		
TOTAL		0	No take of Cumberland bean from habitat loss; no quantitative estimate of spotfin chub take due to loss of habitat	

United States Department of the Interior

FISH AND WILDLIFE SERVICE
446 Neal Street
Cookeville, TN 38501

July 7, 2009

Ms. Peggy W. Shute
Manager, Heritage Resources
Office of Environment and Research
Tennessee Valley Authority
400 West Summit Hill Drive
Knoxville, Tennessee 37902

Dear Ms. Shute:

Thank you for your letter of June 25, 2009, concerning the recently completed section 7 consultation between the Fish and Wildlife Service and the Federal Highway Administration for the replacement of the Potter Ford Road bridge over the Obed River and the Otter Creek Road bridge over Daddys Creek in Cumberland County, Tennessee. We have reviewed the information submitted and we offer the following comments.

We issued a biological opinion to the Federal Highway Administration for the projects on February 5, 2009. Your letter indicates that the Tennessee Department of Transportation must obtain a 26(a) permit from the Tennessee Valley Authority prior to implementation of the projects. Our biological opinion, however, did not include the Tennessee Valley Authority as a consulting agency.

In light of your acceptance of the findings contained in the Federal Highway Administration's biological assessment and your commitment to include as conditions in the 26(a) permit the conservation measures contained in the biological assessment and the Terms and Conditions contained in the biological opinion, this letter serves as an amendment to the biological opinion to include the Tennessee Valley Authority as part of the consultation and acknowledges that the Tennessee Valley Authority has fulfilled its obligations under section 7 of the Endangered Species Act. Please attach this letter to your copy of the biological opinion.

Thank you for your request. Your concern for the protection of endangered and threatened species is greatly appreciated. If you have any questions, please contact Jim Widlak of my staff at 931/528-6481, ext. 202.

Sincerely,

Mary E. Jennings
Field Supervisor

TENNESSEE HISTORICAL COMMISSION
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
2941 LEBANON ROAD
NASHVILLE, TN 37243-0442
(615) 532-1550

March 13, 2008

Mr. Kevin Rose
Federal Highway Administration
Eastern Federal Lands
Highway Division
21400 Ridgetop Circle
Sterling, Virginia 20166-6511

RE: FHWA, FORD RD AND OTTER CREEK RD BRIDGES, UNINCORPORATED, CUMBERLAND COUNTY

Dear Mr. Rose:

The Tennessee State Historic Preservation Office has reviewed the above-referenced undertaking received on Monday, March 3, 2008 for compliance by the participating federal agency or applicant for federal assistance with Section 106 of the National Historic Preservation Act. The Procedures for implementing Section 106 of the Act are codified at 36 CFR 800 (Federal Register, December 12, 2000, 77698-77739).

After considering the documentation submitted, we concur that there are no National Register of Historic Places listed or eligible properties affected by this undertaking. This determination is made either because of the location, scope and/or nature of the undertaking, and/or because of the size of the area of potential effect; or because no listed or eligible properties exist in the area of potential effect; or because the undertaking will not alter any characteristics of an identified eligible or listed property that qualify the property for listing in the National Register or alter such property's location, setting or use. Therefore, this office has no objections to your proceeding with the project.

If your agency proposes any modifications in current project plans or discovers any archaeological remains during the ground disturbance or construction phase, please contact this office to determine what further action, if any, will be necessary to comply with Section 106 of the National Historic Preservation Act. You may direct questions or comments to Jennifer M. Barnett (615) 741-1588, ext. 105. This office appreciates your cooperation.

Sincerely,

E. Patrick McIntyre, Jr.
Executive Director and
State Historic Preservation Officer

EPM/jmb